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THE TRANSPORTATION FACTOR IN THE PRICE OF COAL

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SPEAKING as I do as Vice-President of the National Coal Association, which is an organization of bituminous coal producers, what I have to say on the subject of the transportation factor in the price of coal refers particularly to bituminous coal and not to anthracite.

When the ordinary consumer pays his coal bill he thinks he has paid for coal. As a matter of fact what he has chiefly bought and paid for is transportation service from the coal seam to his furnace room. The discussion of this factor in the cost of coal usually centers about railroad transportation, but in order that you may appreciate more fully the part which the railroad plays in the whole problem of transportation of coal, I want to speak very briefly about some of the transportation problems involved in volume production of coal.

Transportation of bituminous coal from the mine to the consumer begins at the face of the coal seam underground, often two or three or four miles from the tipple where the product is dumped into railway cars. Various methods are used in that underground transportation, ranging all the way from primitive haulage by mule or horse in very small mines to splendid motor haulage over miniature electric railway systems in the larger modern mines. If the mine is a drift mine, that is if it goes directly into the hillside, the trains or " trips " of mine wagons are hauled out and dumped directly into railway cars. If it is a shaft mine, the wagons are brought to the foot of the shaft, uncoupled, lifted to the surface, and then dumped into railroad cars. Sometimes the mine wagons are dumped at the shaft bottom into skips which bring the coal to the surface.

The cost of transporting coal underground upon the mine haulage varies, of course, with many different local conditions, such as the type of haulage used, the grades in the mines, the length of haul, the extent to which falls of the roof have to be cleaned up, the extent to which bottom conditions necessitate repairs to track and increase the track maintenance cost, and similar factors. The range of mine haulage cost is generally between 20 cents and 35 cents per ton, on the basis of present wage scales, out of a total average production cost for 1921 of $2.94 per net ton. There are extremes, of course, above and below those figures, but they represent the general range of transportation costs at the mine at present. Approximately 80% of this haulage cost is direct labor cost in the operation of the mine transportation system. The other 20% is made up of cost of supplies, repair parts and power, and of depreciation on the haulage system.

It must be remembered that these railway systems are equipped with expensive electric or storage batteries, or with compressed air locomotives, and that many of the mines have a large number of cars underground. They are equipped with heavy steel rails. The operators have the problem of maintenance of track under the adverse conditions common to coal mines, with constant falls of slate and rock from the roof, with other difficulties with roof and bottom, with a certain amount of corrosion from mine water and so on. The maintenance of way underground is much more difficult than the maintenance of a railway system on top of the ground. All of these factors enter into that cost of underground transportation. Moreover, the mine transportation system is not used twenty-four hours in the day, as is an outdoor railroad system.

The second element in the transportation cost of bituminous coal is the railway freight rate. Railway freight rates on bituminous coal at present are approximately 93% higher than in 1913. They range from 90 cents per ton on short hauls to $7.25 per ton on such movements as that from the mines of Utah and Colorado to the Pacific Coast. According to George M. Shriver, Vice-President of the Baltimore & Ohio Railroad, the present average railroad transportation charge on all revenue bituminous coal is $2.27 per ton. Not all of the output of bituminous coal bears this transportation charge. Of the total normal production approximately 11% is used at the mines and 89% is shipped away. This 11% is made up as follows: About 3.7% is sold locally to consumers in the vicinity of the mines; 2% is consumed by the mines themselves for power and fuel purposes; and 5.3% is made into coke at the mines. The 89% which is shipped away from the mines moves as follows: 2% by water, chiefly on the Monongahela, Kanawha, Ohio and Mississippi Rivers; and 87% by rail. One-fifth of this 87% is non-revenue railroad fuel coal. This coal is used on the lines of the originating carriers and while it bears a transportation cost, no charge is made by the carrier for the movement of its own fuel supply. This leaves approximately 69.5% of the normal output of bituminous coal as revenue freight, which moves at an average transportation charge of $2.27 per ton. On this coal the total railroad freight charge is something over $780,000,000 annually at the present freight rates.

It is of interest here to call attention to the further fact that this 69.5% of bituminous coal which bears a definite railroad transportation charge is made up of 9% distributed through retail coal dealers to household and small industrial consumers and 60.5% consumed by carload users of coal. The latter consumers, such as railroads upon whose lines there are no coal mines, electric light and power plants, street railways, gas works, by-product coke plants, manufacturing establishments of all kinds, exporters of coal and ship bunkering concerns, pay the freight on that coal themselves; so that their delivered price is made up of the f. o. b. mine price plus the railroad freight on the coal. For the three months of January, February and March, 1922, the general market level of bituminous coal prices for the United States as a whole averaged between $2.05 and $2.33 per ton for run of mine coal. By run of mine coal I mean the coal just as it comes to the surface, without any further cleaning or preparation than what it has received from the miners underground. Bituminous coal is sold not only as run of mine but also in a number of different sizes ranging from fine screenings to eight-inch lump. Just as the freight rates on bituminous coal varied from 90c per ton to more than $7.00 per ton according to the haul, so also the open market prices for bituminous coal during the winter ranged from 75 cents per ton for screenings to $5.00 per ton for the highest grade of especially prepared domestic lump coal.

Before passing on from the subject of railroad transportation of coal I desire to call your attention to another significant fact. Not only is it true, as I have already pointed out, that the freight charge on coal makes up over one-half of the total delivered cost of coal, but it is also true that the freight charge on coal constitutes a much larger percentage of the total delivered cost than is the case with almost any other commodity, and also that the increases in freight rates granted during and since the war have borne with special hardship upon bituminous coal. These facts may be best shown by a few typical illustrations taken from actual shipments before the beginning of the strike.

Let us compare coal with another bulk basic commodity like cement. There is a considerable movement of cement from Allentown, Pennsylvania, to Fairmont, West Virginia. Similarly bituminous coal moves in the opposite direction from Fairmont, West Virginia, to Allentown, Pennsylvania. In 1914 the freight rate on a carload of cement was $75.00, or 22.1% of the value of the shipment. The freight rate on a carload of coal was $87.75, or 58.5% of the value of the shipment. See now how the increases in freight rates between 1914 and 1922 affected these figures. In January, 1922, the freight rate on the cement had been advanced to $142.50, and now constituted 41.9% of the value of the cement. Meanwhile the freight rate on the coal had been increased to $160.65, or 107.1% of the mine cost of the coal. In other words, while the actual increase in the rate on coal was only $5.40 more than that in the rate on cement, that increase constituted 48.6% of the value of the carload of coal and only 19.9% of the value of the carload of cement.

It will be readily seen that if such a relation existed in the case of cheap bulky commodities it would become still more striking in the case of more valuable articles. Without unnecessary details let me quote two other illustrations. Cotton is shipped from Opelika, Alabama, to Birmingham, Alabama, and there is a reverse movement of bituminous coal. In 1914 the freight rate on cotton was 1.4% of the value of the commodity, while that on coal was 50%. As a result of rate increases the freight rate on cotton in January, 1922 was 3% of the value of the shipment, while that on bituminous coal was 95.2% of that value. In other words the increase amounted to 1.6% of the value of the cotton, and 45.2% of the value of the coal.

On the shipment of automobiles from Detroit to Athens, Ohio, and of bituminous coal from Athens, Ohio, to Detroit, we have the following corresponding figures. In 1914 for automobiles the freight rate was 1.1% of the value of the shipment, while on the coal the rate was 63.9% of that value; in January, 1922, for automobiles the percentage was 2.4% and for bituminous coal 137.2%, showing an increase in the case of automobiles amounting to 1.3% of the value of the shipment, and in the case of bituminous coal to no less than 73.3% of the value. These illustrations are sufficient to give force to the point often made, that the transportation charge on coal is so high as to constitute a serious burden upon the consumer, and furthermore that the method of increasing freight rates in recent years has greatly augmented that burden.

While bituminous coal for household use constitutes between 11% and 12% of the total output, about 3% out of this 12% is consumed in the vicinity of the mines and does not move on railroad lines. On the remaining 9% freight is paid from the mine to the retail dealer's yard. It then must bear an additional transportation charge, namely, the transportation cost of the retail delivery of the coal. Little definite detailed information is available as to this particular item of transportation cost. Inquiry among representative retail dealers, however, indicates a range in transportation costs for the delivery of domestic bituminous coal of from 70 cents per ton to $1.75 per ton. The low delivery costs are obtained where large lots are delivered regularly in 5 to 10 ton trucks. The high costs are incurred in small irregular deliveries to householders. The difference in the volume of deliveries may double the cost of delivery in summer as compared with winter. It should be clearly understood here that haulage cost is only a part of the cost of retailing coal. Office and yard employees' wages and salaries, insurance premiums, taxes, telephone and telegraph charges, allowance for depreciation of plant and equipment, and losses due to degradation and deterioration of the coal handled, constitute a large part of the total cost of retail coal distribution, just as many other items besides haulage go to make up the total cost of mining coal.

What is the prospect for a reduction in some of these transportation costs in the prices of bituminous coal?

So far as the haulage cost in the mine is concerned, reductions in wage scales at the bituminous mines will, of course, correspondingly reduce the haulage cost of the coal, and there is a constant progressive improvement in mine haulage facilities and methods which tend to lower costs.

With respect to railway transportation charges on bituminous coal, the Interstate Commerce Commission now [1] has under consideration the evidence submitted in its general inquiry into the present level of freight rates. As railroad operating costs decline we may expect a decline in the railroad transportation charges on coal.

With respect to the cost of delivery of bituminous coal by retail dealers, so far as wages paid employees of retail coal concerns may be reduced, a corresponding reduction in such retail delivery costs may likewise be anticipated. Better methods of distributing household coal may also gradually operate in the same direction.

It is frequently suggested that a steadier movement of coal from the mines to the user would materially lower the transportation charge. This opinion is predicated on the assumption that bituminous coal moves to market with great seasonal irregularity. Examination of the facts, therefore, may be enlightening as to the possible economies in the transportation of coal which might be effected by an equalization of summer and winter movement.

I have analyzed the production of bituminous coal as reported by the United States Geological Survey month by month for the last nine years, averaging the monthly production for the six summer months, April to September, in comparison with the production for the six winter months, from October to March. Such analysis shows that of the total output of bituminous coal during these nine years, 48.9% was produced and shipped from the mines in the six summer months and 51.1% in the six winter months. Considered as a whole, therefore, the bituminous coal industry is not at all a seasonal industry; in fact, but few of the great industries of the United States approach it in steadiness of operation. Whatever economies might be expected from an equalization of summer and winter movement would necessarily be confined to particular coal-mining districts where the movement of coal is seasonal.

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[1] April 28, 1922. The decision handed down by the Interstate Commerce Commission on May 16, 1922, reduced all freight rates, including those on bituminous coal, approximately ten per cent, effective July 1, 1922.

I realize that a general statement for the industry as a whole, and a general average for the industry as a whole, is somewhat like the average temperature of the patients in a hospital. The average may be pretty nearly normal and yet a particular patient may be seriously ill.

On the same principle, while the average seasonal variation for the whole bituminous coal industry is low, there is seasonal movement in some mining districts. This is notably true in the western part of the United States, where the chief consumption of bituminous coal is in the households and where the requirements of railways and industrial establishments are comparatively small.

At this point let me direct attention to the difference in summer and winter consumption of some of our major industries. Studies by the United States Geological Survey indicate that the railways of the United States consume only 10% or 15% more coal in winter than in summer. The great public utilities, gas plants, electrical plants, street railway systems, by-product coke plants and the steel industry show similar very slight differences between summer and winter consumption of coal. The cement-manufacturing industry consumes more coal in the summer months than in winter. Throughout the great Appalachian coal-mining fields, which produce some two-thirds of our total annual output, the great bulk of the production goes to these transportation and industrial users. The slight decline in their summer demands upon the mines is counterbalanced by the summer shipments up the Great Lakes to the Northwest, and by rail and water both into Canada and into New England for storage against the succeeding winter's requirements. Thus, throughout all these great coal-producing districts there is no important seasonal fluctuation in the production and shipment of bituminous coal.

The studies of the United States Geological Survey already mentioned show that the one striking difference in amount between the summer and the winter consumption of bituminous coal is found in the consumption of households, the domestic users. From a winter maximum of 10,000,000 tons per month, their consumption drops in the summer to but little over 2,000,000 tons per month. Here is a winter maximum five times as great as the summer minimum compared with only 10 to 20% difference in the case of the railways and industrial consumers.

Equalization of the summer and winter movement of coal from the bituminous mines, therefore, considered from a practical standpoint and stripped of all optimistic misunderstanding, comes simply and squarely down to a question of persuading the domestic consumer to put in his household coal in fairly regular quantities throughout the year. He who would regulate the production of bituminous coal for the purpose of bringing about steady mine production in the interest of coal mine operators, employees and consumers, should understand clearly that the real regulating must be applied not to the mines, but to the domestic user of the product.

It is proper at this point to consider what means may be employed to attempt to equalize the shipments of household coal from the mines throughout the year. Seasonal variations in freight rates have been proposed for this purpose. The National Coal Association has neither advocated nor opposed this measure. Operators in some parts of the country favor seasonal freight rates; other operators oppose the project. It is claimed that a spread between summer and winter rates will induce enough householders to buy coal during the summer so that the production of this type of coal and operation of the mines producing it will be stabilized throughout the year. Opponents of this proposal assert that in most districts a very wide spread would have to be employed in order to bring about such a result, because it would have to compensate the consumer for the additional expense entailed in carrying his coal supply for some months and for any degradation of the coal while in storage. In the mining districts which are in most need of summer business, the mines of Oklahoma, Kansas, Iowa and Illinois, the coal deteriorates decidedly in storage even in the householders' cellars, while the output of the lignite mines of Colorado, which furnish the fuel of Denver, eastern and western Kansas, and Nebraska, will not store at all, but must be used fresh from the mines.

Opponents also point out that the increased railroad rates on coal in the winter time would have to be paid by those consumers who can least afford to pay the charges, namely: the poorer class, those householders and consumers who have neither the facilities nor the money to permit them to take advantage of the lower summer rates. Such a system, therefore, would simply penalize these poorer consumers of coal and benefit their richer neighbors at their expense. Railroad officials object that a decided change in freight rates on a given date would result in shipments being withheld just prior to a decrease in freight rates and being increased prior to an advance in rates, with a consequent irregularity of mine and railroad operation in the period immediately preceding and following the change in rates.

It has been suggested also that producers of bituminous coal should make a difference in their prices at the mine, reducing the price levels in the spring and gradually increasing them through the summer, so as to persuade the consumer in that manner to take in at least a part of his coal supply during the spring and summer months, thereby stabilizing production.

It will be readily seen that much of what has been said as to seasonal variations in freight rates applies here with equal force. In addition, it should be pointed out that competition in the open market normally reduces prices to their lowest levels in the early spring months when demand is at a minimum. Since bituminous coal prices are determined by competition in the open market no individual operator, or group of operators is any more able to arrange in advance a schedule of prices month by month throughout the year than a grower of hogs in Indiana can determine in advance the price at which he will sell his hogs in different months. It has been found possible for distributors of anthracite coal to put arrangements of this character into effect, but they are dealing with a commodity which can be stored readily and of which the production is limited by nature, so that methods of marketing the output can be applied there which are wholly impracticable in the case of bituminous coal.

It is frequently urged that coal producers should store a part of their output at the mines in summer and thus render the operation of their properties more stable and regular. This proposal has the defect of being impractical. Coal mines are organized, equipped and operated to send coal forward on a continuous journey from the face of the coal seam to the boiler room of the consumer. The production, transportation and distribution of that coal is obtained at the most economical cost when that movement is uninterrupted. As it comes from the underground mine wagons coal is dumped directly into railroad cars and shipped straight through to the plant or retail yard of the buyer. That is the most economical manner in which coal can be produced and moved. If it is carried two or three miles from the face of the coal seam underground out into the daylight at the mouth of the mine and there dumped on the ground or put into storage bins from which it must be again loaded into cars, there is an increase in the cost of the coal consequent upon the additional handling involved.

There is also a certain degradation and deterioration of the product in storage. This stored coal must be sold by the producer who has stored it at a higher price than his freshly mined coal, if he is to avoid a loss on the operation. But on account of the deterioration of the product during storage this stored coal for which he must ask a higher price is a less efficient and less desirable fuel than his freshly mined coal which his salesman can offer at a lower price. If he should attempt to equalize his prices or place a sufficient premium upon his freshly mined coal to allow him to sell his higher-cost storage coal at a discount he will merely invite numerous competitors to take his business away from him through their offers of freshly mined coal at prices below his quotations. In short, a producer who should store considerable quantities of his own coal at the mines would inevitably find himself caught between the competition of his own freshly mined coal and his storage coal, and would have to accept an inevitable loss on the transaction in consequence. No sane business man would attempt any such enterprise, nor would he get any sane banker to finance it even if he were foolish enough to try it.

The proposal is impracticable for another reason. The mines already open have an over-capacity of approximately

40%. In other words, these mines can currently furnish 40% more freshly mined coal than the country needs. In the absence of strikes at the mines the only thing which has ever prevented the mines from meeting all demands of consumers with current daily shipments of freshly mined coal direct from the mine tipples has been the inability of the railway lines to transport the tonnage demanded by consumers. These consumers have never failed to get their coal because of inability of the mines to produce it, but only through the inability of the railroads to handle it when shipped. Now, if the railroads in time of maximum demand are not able to place railroad cars enough at the mines to carry away the coal that is being mined from day to day, what opportunity would a mine operator have to obtain cars to take coal from storage in addition to shipping his usual daily output?

As a matter of fact, there is already a tremendous storage of coal in the United States, not in the mining districts, but where the storage ought to be, namely, in or adjacent to the consuming centers. Consumers and wholesale and retail distributors of coal in the United States have provided facilities in which they regularly store from 40,000,000 to 50,000,000 tons of bituminous coal annually. Just prior to the signing of the Armistice they had stored over 60,000,000 tons and at the beginning of the present strike they had utilized these facilities to store approximately 65,000,000 tons, in addition to the amount upon the docks at the head of the lakes. If the capacity of these docks is included, the total possible storage by consumers and distributors of coal in the United States exceeds 70,000,000 tons. This is practically all storage by the consumers, who own these great stocks and are, therefore, insured against any raising of prices on this tremendous tonnage. Storage of this kind has developed wherever it is practical; that is, wherever the service to the user of the coal in actual practice justifies the investment and the expense of installing and operating the facilities for storage and compensates him for the deterioration of the coal.

The greatest future saving in the cost of moving coal from the mine to the user will doubtless come not through the adoption of artificial devices in the coal industry, but through transporting the energy in the coal instead of the coal itself. By this I mean that long-distance, high-tension transmission of electricity and the transmission of gas manufactured from the coal will be the practical means of reducing the transportation cost to the user of the energy of coal. Engineers already look forward to utilizing a large part of the output of bituminous coal at the mines or in the immediate vicinity of the mines and to transmitting from the mines to important consuming centers in the form of electricity or gas the energy thus developed from the most efficient combustion of the coal. They also look forward to a much more general use of gas as a domestic and household heating fuel than at present. Such transmission of energy from the mines would go far to remove coal from the rails of our transportation systems, upon which coal now constitutes approximately one-third of all the freight moved. Improvement in the manufacture of gas from coal, with the consequent wider use of gas as a domestic fuel, is expected to reduce the ultimate cost of heating our dwellings. There is not time here to discuss the details of developments in these directions. Let me merely say that competent authorities believe the future will bring almost revolutionary changes in the transportation of coal through the means just indicated.